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ANTIFREEZE COOLING SUBSYSTEM

Abstract

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Liquid cooled systems having coolant circulation loops must often operate in below freezing conditions. For instance, in various applications certain fuel cell systems must be able to tolerate repeated shutdown and storage in below freezing conditions. Conventional glycol-based coolants typically used for internal combustion engines are generally unsuitable for use in the associated fuel cell cooling subsystems due to the presence of additives and/or inhibitors which are normally included to deal with problems relating to decomposition of the glycol. With additives or inhibitors present, the coolant conductivity can be sufficiently high as to result in electrical shorting or corrosion problems. However, provided the purity of the coolant is maintained, a pure glycol and water coolant mixture may be suitably used as a fuel cell system coolant to obtain suitable antifreeze protection. Adequate purity can be maintained by including an ion exchange resin unit in the cooling subsystem.